

A BAYESIAN APPROACH TO IMAGE INPAINTING

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Abstract. During the last two decades, many different techniques and algorithms for reconstructing damaged or missing portions of an image have been proposed and studied. Among those tools we mention the use of PDE-driven diffusion techniques ([1]), interpolation vector fields ([2]), total variation regularization ([3]) and anisotropic and curvature-driven diffusion ([4]), to cite just a few. In this presentation we will consider inpainting as an inverse ill-posed problem. Then, a Bayesian approach with data-based structural priors will be considered to solve the problem of inpainting images with occlusions in regions with sharp intensity gradients. Advantages with respect to traditional inpainting methods will be discussed and several examples will be shown.

[1] Bertalmio M., Sapiro G., Ballester C., Caselles V., Image inpainting, *Computer Graphics, SIGGRAPH 2000*, 2000, pp. 417-424.

[2] Ballester C., Bertalmio M., Caselles V., Sapiro G., Vergera J., Filling-in by joint interpolation of vector field and gray levels, *IEEE Trans. Image Process*, 10 (2001) 1200-1211.

[3] Chan T. F., Shen J., Mathematical models for local nontexture inpainting, *SIAM J. Appl. Math.* 62 (2002) 1019-1043.

[4] Chan T., Shen J., Non-texture inpainting by Curvature-Driven Diffusions (CDD), *J Vis. Commun. Image Represent.* 12 (2001) 436-449.